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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,639	10/31/2001	Liu He	4327P005	4461

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EXAMINER
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BLACKWELL RUDASIL, GWENDOLYN A

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/001,639	<b>Applicant(s)</b> HE ET AL.	
	<b>Examiner</b> Gwendolyn A. Blackwell-Rudasill	<b>Art Unit</b> 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 June 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 22-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 30-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### **DETAILED ACTION**

1. Claims 1-32 are presently pending. Claims 1-21 and 30-32 are examined on the merits. Claims 22-29 are withdrawn as being drawn to a non-elected invention.

#### ***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 22, 2004 has been entered.

#### ***Response to Arguments***

3. Applicant's arguments filed June 22, 2004 have been considered. Applicant's arguments with regards to the rejections of claims 1-21 and 32 are moot in view of Applicant's amendment of claim 1. The present claims do not require that the crystalline metal compound is introduced through a solvent.
4. Applicant contends that EP '587 does not teach or suggest a layer including a colloid including particles of a crystalline metal compound and a condensation or an organosilane. This is not persuasive as EP '587 does teach the use of crystalline metal compounds (page 6, section 0047), surface treated with an silane coupling agent (page 6, section 0048), and dispersed in a liquid medium through the use of a colloid mill, (page 6, section 0053).

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless –*

*(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

6. Claims 1-10, 12-20, and 30-31 are rejected under 35 U.S.C. 102(b) as being anticipated by European Patent Application Publication no. 1 022 587 A1, EP '587.

*Regarding claims 1-4, 12, and 15-16*

EP '587 disclose an anti-reflection coating the can be multilayered. The coating structure in relation to the placement of the high-, low-, and middle-refractive index layers are demonstrated in figures 1(b) and 1(c). The low-refractive layer is formed on top of the high-refractive index layer, which is nearest to the substrate unless there is a middle-refractive index layer. If a middle refractive index layer is used in the coating, the middle-refractive index layer is formed over the substrate with the high-refractive index layer formed thereon and the low-refractive index layer formed on the high-refractive index, (page 4, sections 0026-0030).

EP '587 disclose that the high index layer has a refractive index ranging from 1.65-2.40 with a thickness of 5 nm – 100  $\mu$ m. In addition, the high index layer contains inorganic fine particles such as metals that can have a crystalline structure in addition to a silane surface treatment, meeting the requirements of claims 1-4, 12, and 15-16, (pages 5-6, sections 0036-0053).

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*Regarding claims 5-10, 17-20, and 30-31*

EP '587 further disclose that the low index layer has a refractive index ranging from 1.20-1.55 having a thickness from 50-400 nm. Silicon dioxide can be contained in the low index layer, (page 11, sections 0097-0105). In addition, the low index layer includes a silane-coupling agent, (page 12-14 sections 0121-0136). The binder polymer used in the low index layer can be a monomer having two or more ethylenic unsaturated groups such as a methacrylic acid, (pages 15-16, sections 0153-0160). The inorganic particles in the high refractive index layer can be dispersed in a liquid medium and mixed in a colloid mill, (page 6, section 0053). Example 1 demonstrates that UV light is used to cure the high and low index layers, meeting the requirements of claims 5-10, 17-20, and 30-31, (page 19, sections 0192-0196).

*Regarding claims 13-14*

EP '587 continue to disclose a middle index layer that is located between the substrate and the high index layer. The refractive index for the middle index layer ranges from 1.55-1.70. Inorganic particles can also be added to the layer, (pages 16-17, sections 0166-0175). Example 12 demonstrates that the middle index layer can have a thickness of 75 nm, meeting the requirements of claims 13-14, (page 26, section 0241).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person*

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*having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 11, 21, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent Application Publication no. 1 022 587 A1, EP '587 as applied to claims 1-10, 12-20, and 30-31 above, and further in view of United States Patent no. 4,765,729, Taniguchi.

*Regarding claims 11, 21, and 32*

EP '587 disclose the limitations of claims 1-10 and 12-20 above. In addition, the low index layer includes a silane-coupling agent, (page 12-14 sections 0121-0136). Furthermore, the low index layer can contain also contain initiators (multi functional monomer) for the polymerization of the inorganic particles, (page 15, sections 0147-0148). EP '587 do not specifically disclose the type of silane agents as exemplified by Applicant.

Taniguchi et al disclose an anti-reflection film wherein the film utilizes crosslinked polymers to improve heat, hot water and chemical resistance, (column 3, lines 50-53). Organic silicon compounds such as trialkoxysilanes, dialkoxysilanes, (column 4, lines 3-49), and tetraalkoxysilane, (column 7, lines 1-16), can be used in the film. In addition to the above-

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mentioned compounds a fluorine containing mixture such as a perfluoro group containing (meth)acrylate can be added to the silicon compounds, (column 7, lines 21-25).

EP '587 and Taniguchi et al disclose inventions that are utilized in the formation of anti-reflective films used on display devices. EP '587 disclose that silane-coupling agents are used in the low index layer. Taniguchi et al disclose organic silicon compounds that are used as crosslinking agents wherein the formula used by Taniguchi et al, (column 3, line 5), satisfies the formula requirements as set forth in EP '587 that can be used as a coupling agent, (page 13, sections 0121-0126). As such, it would have been obvious to one skilled in the art to use the organic silicon compounds of Taniguchi et al in the anti-reflection film of EP '587 to create a low index layer that has improved heat, hot water and chemical resistance, (Taniguchi et al, column 3, lines 50-53).

### ***Conclusion***

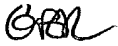
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gwendolyn A. Blackwell-Rudasill whose telephone number is (571) 272-1533. The examiner can normally be reached on Monday - Thursday; 5:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gwendolyn A. Blackwell-Rudasill  
Examiner  
Art Unit 1775

  
gbr

  
DEBORAH JONES  
SUPERVISORY PATENT EXAMINER